IN THE CLAIMS:

1. (ORIGINAL) A file server system for a computer having a processor, a memory coupled to the processor, and a system bus to which the processor and memory are coupled, the computer being configured to implement a file system, the file server system comprising:

    (A)   a storage operating system adapted to be executed by the processor;

    (B)   a removable nonvolatile memory device coupled to the system bus, the removable nonvolatile memory device containing diagnostics code for the system; and

    (C)   a set of boot instructions resident in the filer server system including instructions for executing a normal boot routine upon a power-on of the system, and including instructions enabling the processor to identify the removable nonvolatile memory device and to load the diagnostics code into the memory in response to a command to execute a diagnostics boot routine instead of the normal boot routine.

2. (ORIGINAL) The system as defined in claim 1 wherein the removable nonvolatile memory device is a compact flash, the compact flash being divided into a plurality of partitions with the diagnostics code residing in at least one of the partitions.

3. (ORIGINAL) The system as defined in claim 2 wherein one of the partitions of the compact flash is designated as a maintenance log into which test results and data are stored.

4. (ORIGINAL) The system as defined in claim 2 further comprising:

    (A)   a input/output device coupled to the system bus, and which input/output device is identifiable by the processor; and

4   (B)   a second bus coupled between the input/output device and the compact

5   flash in such a manner that when the processor identifies the input/output device, the

6   compact flash is, in turn, initialized and the diagnostics code is executed upon a com-

7   mand to run a diagnostics boot routine.

1   5. (ORIGINAL)   The system of claim 1 further comprising:

2   (A)   a storage adapter coupled to the system bus; and

3   at least one storage disk coupled to the storage adapter and containing files served by the

4   operating system.

1   6. (PREVIOUSLY PRESENTED)   A file server system for a computer having a proces-

2   sor, a memory coupled to the processor, and a system bus to which the processor and

3   memory are coupled, the computer being configured to implement a file system, the file

4   server system comprising:

5   (A)   a storage operating system adapted to be executed by the processor;

6   (B)   a removable nonvolatile memory device coupled to the system bus, the

7   removable nonvolatile memory device containing diagnostics code for the system;

8   (C)   a set of boot instructions resident in the filer server system including in-

9   structions for executing a normal boot routine upon a power-on of the system, and includ-

10   ing instructions enabling the processor to identify the removable nonvolatile memory de-

11   vice and to load the diagnostics code into the memory in response to a command to exe-

12   cute a diagnostics boot routine instead of the normal boot routine;

13   (D)   a storage adapter coupled to the system bus;

14   (E)   at least one storage disk coupled to the storage adapter and containing files

15   served by the operating system; and

16   (F)   a plurality of storage disks coupled to the storage adapter and data on the

17   disks being stored in a write anywhere file layout system.

1   7. (ORIGINAL)   The system as defined in claim 1 further comprising a motherboard

2   upon which the processor, the memory and the set of boot instructions reside.

1   8. (ORIGINAL)   The system as defined in claim 7 wherein the removable nonvolatile

2   memory device containing the diagnostics code is resident external to the motherboard,

3   and the diagnostics code on the removable nonvolatile memory device is adapted to be

4   upgraded or amended free of taking the system out of service.

1   9. (PREVIOUSLY PRESENTED)   The system as defined in claim 1 wherein said diag-

2   nostic code includes code relating to the diagnostics of hardware devices including the

3   processor, the memory, the buses, the adapters, the disks, a compact flash and interfaces

4   thereof.

1   10. (ORIGINAL) The system as defined in claim 1 wherein said boot instructions reside

2   in firmware.

1   11. (CURRENTLY AMENDED) A method of performing diagnostics in a filer server

2   system, the filer server system having a processor, a memory coupled to the processor

3   and having memory locations addressable by the processor, a storage operating system

4   adapted to be executed by the processor, system firmware containing instructions for

5   power-on self tests, a set of boot instructions including instructions for executing a nor-

6   mal boot routine upon a power-on of the system after the power-on self test is completed,

7   the method comprising the steps of:

8   (A) providing a removable nonvolatile memory device interfaced with the moth-

9   erboard, the removable nonvolatile memory device being identifiable to the processor;

10   (B) dividing the removable nonvolatile memory device into separate memory par-

11   titions;

12   (C) storing a set of diagnostics instructions, being a diagnostics code, in one of the

13   partitions of the removable nonvolatile memory device; and

14   (D) programming the system firmware to recognize a user implemented command

15   <u>entered during the normal boot routine</u> for a diagnostics boot such that in response to the

16   diagnostics boot command, the firmware loads the diagnostics code residing in the re-

17   movable nonvolatile memory device into the memory to execute a diagnostic boot routine

18   instead of a normal boot routine.

1   12. (ORIGINAL)   The method as defined in claim 11 including the further step of

2   (E)   maintaining, in a separate partition of the removable nonvolatile memory

3   device, a maintenance log into which diagnostic test results data and data about the stor-

4   age system are stored.

1   13. (ORIGINAL) The method as defined in claim 11 including the further step of:

2   selecting as the removable nonvolatile memory device, a compact flash.

1   14. (ORIGINAL) The method as defined in claims 11 including the further step of:

2   selecting as the removable nonvolatile memory device a personal computer (PC)

3   card.

1   15. (ORIGINAL) The method as defined in claim 11 including the further step of:

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2   upgrading the diagnostics code without taking the file server out of service.

1   16. (ORIGINAL) A storage system for a computer configured to implement a file sys-

2   tem, the storage system having a processor, a memory coupled to the processor and hav-

3   ing memory locations addressable by the processor, a system bus to which the memory

4   and the processor are coupled, an operating system adapted to be executed by the proces-

5   sor, system firmware containing instructions for power-on self tests and a set of instruc-

6   tions for executing a normal boot routine upon a power-on of the system after a power-on

7   self test is completed, the storage system comprising:

8   (A)   means for storing a set of diagnostics instructions comprising diagnostics

9   code, in a removable nonvolatile memory device coupled to the system bus, the remov-

10   able nonvolatile memory device being identifiable to the system; and

11   (B)   means for executing the diagnostics code in response to a diagnostics boot

12   command received by system firmware.

1   17. (ORIGINAL) The storage system of claim 16 further comprising:

2   means for coupling the removable nonvolatile memory device to the processor in

3   such a manner that the diagnostics code may be upgraded without taking the storage sys-

4   tem out of normal service.

1   18. (ORIGINAL) The storage system of claim 17, further comprising:

2   means for upgrading the diagnostics code by interfacing with the storage system

3   through an associated input/output interface.

1   19. (ORIGINAL) A computer-readable medium operating on a computer in a network

2   that includes one or more storage systems sharing volumes, the computer-readable me-

3   dium including program instructions for performing the steps of:

4   (A)   initiating a power-on self test when the computer is powered-on;

5   (B)   identifying devices present in the computer;

6   (C)   in response to a successful power-on self test, commencing a normal boot

7   routine;

8   (D)   recognizing a command for a diagnostics boot;

9   (E)   in response to the diagnostics boot command, probing devices to locate a

10   removable nonvolatile memory device containing diagnostic boot instructions; and

11   (F)   interrupting the normal boot routine and executing the diagnostics code for

12   a diagnostics boot for the computer.

1   20. (ORIGINAL) The computer readable medium as defined in claim 19 including the

2   further instruction to identify a compact flash as the removable nonvolatile memory de-

3   vice in which diagnostics code for the computer is stored.

1   21. (ORIGINAL) The computer readable medium as defined in claim 20 including fur-

2   ther instructions to save diagnostics test results and other data in a predetermined address

3   location in the compact flash associated with the computer.

1   22. (ORIGINAL) The computer readable medium as defined in claim 21 wherein the

2   diagnostics boot command is initiated by a human maintenance operator.

23. (ORIGINAL) The computer readable medium as defined in claim 21 wherein the diagnostics boot command is initiated as an instruction in the computer readable medium upon the occurrence of a predetermined event.

24. (ORIGINAL) A diagnostic system for use with a storage system comprising:

a removable nonvolatile memory device interconnected with the storage system, wherein the removable nonvolatile memory device containing boot diagnostic code that is loadable into the storage system as an alternative to a normal boot routine.

25. (ORIGINAL) The diagnostic system of claim 24, wherein the removable nonvolatile memory device further comprises a plurality of partitions.

26. (ORIGINAL) The diagnostics system of claim 25, wherein the boot diagnostic code is contained within a first partition of the plurality of partitions.

27. (ORIGINAL) The diagnostic system of claim 26, wherein the removable nonvolatile memory device further comprises a second partition, the second partition storing a diagnostic log.

28. (ORIGINAL) The diagnostic system of claim 24, wherein the removable nonvolatile memory device is a PC card.

29. (ORIGINAL) The diagnostic system of claim 24, wherein the removable nonvolatile memory device is a compact flash.

1   30. (ORIGINAL) The diagnostic system of claim 24, wherein the storage system further

2   comprises a firmware boot routine, the firmware boot routine having a process for select-

3   ing between execution of either a normal boot routing or a diagnostic boot routine.

1   31. (ORIGINAL) A file server system for a computer having a processor, a memory

2   coupled to the processor, and a system bus to which the processor and memory are cou-

3   pled, the computer being configured to implement a file system, the file server system

4   comprising:

5   (A)   a storage operating system adapted to be executed by the processor;

6   (B)   a removable nonvolatile memory device coupled to the system bus, the

7   removable nonvolatile memory device containing diagnostics code for the system, the

8   removable nonvolatile memory device also divided into a plurality of partitions with the

9   diagnostics code residing in at least one of the partitions; and

10   (C)   a set of boot instructions resident in the filer server system including in-

11   structions for executing a normal boot routine upon a power-on of the system, and includ-

12   ing instructions enabling the processor to identify the removable nonvolatile memory de-

13   vice and to load the diagnostics code into the memory in response to a command to exe-

14   cute a diagnostics boot routine instead of the normal boot routine.

1   32. (ORIGINAL) The system of claim 29 wherein one of the partitions is designated as a

2   maintenance log into which test results and data are stored.

1   33. (ORIGINAL) The system of claim 29 further comprising:

2   a separate storage medium, the separate storage medium storing a boot routine.

34. (PREVIOUSLY PRESENTED) The system of claim 33, wherein the separate storage medium is a partition on the removable nonvolatile memory device.

35. (NEW) A computer having a processor and a main memory, the computer comprising:

a non-removable non-volatile memory device containing a boot mechanism firmware, the boot mechanism firmware configured to provide a normal boot routine and select a first logical drive to boot from;

a user interface configured to allow a user to enter a command to run a diagnostic routine; and

a removable non-volatile memory device storing the diagnostic routine, at least a portion of the removable non-volatile memory device configured as a second logical drive, the boot mechanism firmware configured to, in response to the user's command, select the second logical drive to boot from and load the diagnostic routine into main memory.

36. (NEW) The computer of claim 35 wherein the at least a portion of the removable non-volatile memory device is a memory partition of the removable non-volatile memory device.

37. (NEW) The computer of claim 35 further comprising:

an additional portion of the removable non-volatile memory configured to store a maintence log generated by the diagnostic routine.

1   38. (NEW) The computer of claim 37 wherein the additional portion of the removable

2   non-volatile memory is an additional memory partition that is configured as a third logi-

3   cal drive.

1   39. (NEW) The computer of claim 35 further comprising:

2   a file system for accessing logical drives, the file system configured to upgrade or

3   modify contents of the removable non-volatile memory while the computer is online by

4   accessing the removable non-volatile memory as a drive.

1   40. (NEW) The computer of claim 35 wherein the removable non-volatile memory de-

2   vice is a compact flash.

1   41. (NEW) A method for performing diagnostics on a computer having a processor and a

2   main memory, the method comprising the steps of:

3   configuring a boot mechanism firmware to provide a normal boot routine;

4   providing a user interface to allow a user to enter a command to interrupt the

5   normal boot routine and run a diagnostic routine, the diagnostic routine stored on a re-

6   movable non-volatile memory, at least a portion of the removable non-volatile memory

7   device configured as a logical drive; and

8   selecting, in response to the user's command, the logical drive to boot from and

9   loading the diagnostic routine into main memory.

1   42. (NEW) The method of claim 41 further comprising the step of:

2   partitioning the removable non-volatile memory device into a plurality of memory

3   partitions such that the at least a portion of the removable non-volatile memory device is

4   a memory partition.

1   43. (NEW) The method of claim 41 further comprising the step of:

2   configuring an additional portion of the removable non-volatile memory to store a

3   maintence log generated by the diagnostic routine.

1   44. (NEW) The method of claim 43 further comprising the step of:

2   partitioning the removable non-volatile memory device into a plurality of memory

3   partitions such that the additional portion of the removable non-volatile memory is an

4   additional memory partition; and

5   configuring the additional memory partition as a third logical drive.

1   45. (NEW) The method of claim 41 further comprising the step of:

2   modifying the contents of the removable non-volatile memory while the computer

3   is online by accessing the removable non-volatile memory as a drive.

1   46. (NEW) The method of claim 41 wherein the removable non-volatile memory device

2   is a compact flash.

1   47. (NEW) A computer having a processor and a main memory, the computer compris-

2   ing:

3   a non-removable non-volatile memory device containing a boot mechanism firm-

4   ware, the boot mechanism firmware configured to provide a normal boot routine and se-

5   lect a first logical drive to boot from;

6   a user interface configured to allow a user to enter a command to interrupt the

7   normal boot routine and run a diagnostic routine; and

8   a removable non-volatile memory device storing the diagnostic routine, at least a

9   portion of the removable non-volatile memory device configured as a second logical

10 drive, the boot mechanism firmware configured to, in response to the user's command,

11 select the second logical drive to boot from and load the diagnostic routine into main

12 memory.

1 48. (NEW) A computer having a processor and a main memory, the computer compris-

2 ing:

3   a boot mechanism firmware configured to provide a normal boot routine;

4   a removable non-volatile memory, at least a portion of the removable non-volatile

5   memory device configured as a logical drive and configured to store a diagnostic routine;

6   and

7   a user interface configured to allow a user to enter a command to interrupt the

8   normal boot routine the user interface configured to, in response to the user's command,

9   select the logical drive to boot from and load the diagnostic routine into main memory.

49. (NEW) A computer having a processor and a main memory, the computer compris-
ing:

      means for providing a normal boot routine;

      means for allowing a user to enter a command to interrupt the normal boot routine
and run a diagnostic routine, the diagnostic routine stored on a removable non-volatile
memory, at least a portion of the removable non-volatile memory device configured as a
logical drive; and

      means for selecting, in response to the user's command, the logical drive to boot
from and loading the diagnostic routine into main memory.

50. (NEW) A computer readable medium containing executable program instructions
for performing diagnostics on a computer, the executable program instructions compris-
ing program instructions for:

      providing a normal boot routine;

      providing a user interface to allow a user to enter a command to interrupt the
normal boot routine and run a diagnostic routine, the diagnostic routine stored on a re-
movable non-volatile memory, at least a portion of the removable non-volatile memory
device configured as a logical drive; and

      selecting, in response to the user's command, the logical drive to boot from and
loading the diagnostic routine into main memory.

51. (NEW) The system of claim 1 further comprising:

      (D) the set of boot instructions configured to boot the system from a logical drive
associated with the removable nonvolatile memory device.